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**Complete if Known**

Application Number	10/593,918
Filing Date	September 22, 2006
First Named Inventor	James M. Tour
Art Unit	N/Y/A
Examiner Name	Unknown
Attorney Docket Number	11321-P086WOUS

## U. S. PATENT DOCUMENTS

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## FOREIGN PATENT DOCUMENTS

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Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear
		Country Code <sup>3</sup> -Number <sup>4</sup> -Kind Code <sup>5</sup> (if known)	MM-DD-YYYY		
		WO 01/30694 A1	05-03-2001	Smalley et al	
		WO 02/60812 A2	08-08-2002	Tour et al	

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Substitute for form 1449/PTO  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  <i>(Use as many sheets as necessary)</i>		<b>Complete if Known</b>			
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Sheet	2	of	5	Attorney Docket Number	11321-P086WOUS

NON PATENT LITERATURE DOCUMENTS			
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	1	Iijima et al., "Single-Shell Carbon Nanotubes of 1-nm Diameter", Nature (1993) 363, 603	
	2	Bethune et al., "Cobalt-Catalysed Growth of Carbon Nanotubes with Single-Atomic-Layer Walls", Nature (1993) 363, pp. 605-607	
	3	Endo et al., "The Production and Structure of Pyrolytic Carbon Nanotubes (PCNTs)", Phys. Chem. Solids (1993) 54, pp. 1841-1848	
	4	Zhu et al., "Improving the Dispersion and Integration of Single-Walled Carbon Nanotubes in Epoxy Composites...", Nano Lett. (2003) 3, pp.1107-1113	
	5	Baughman et al., "Carbon Nanotubes - the Route Toward Applications", Science (2002) 297, pp. 787-792	
	6	Dyke et al., "Covalent Functionalization of Single-Walled Carbon Nanotubes for Material Applications", J. Phys. Chem. A, (2005) 108, pp. 11151-11159	
	7	Chen et al., "Solution Properties of Single-Walled Carbon Nanotubes", Science, (1998) 282, pp. 95-98	
	8	Mickelson et al., "Fluorination of Single-Wall Carbon Nanotubes", Chem. Phys. Lett., (1998) 296, pp. 188-194	
	9	Boul et al., "Reversible Sidewall Funtionalization of Buckytubes", Chem. Phys. Lett. (1999) 310, pp. 367-372	
	10	Dresselhaus et al., "Science of Fullerenes and Carbon Nanotubes", Academic Press, San Diego, (1996)	

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	11	Bahr et al., "Covalent Chemistry of Single-Wall Carbon Nanotubes", J. Mater. Chem., (2002) 12, pp. 1952-1958	
	12	Holzinger et al., "Sidewall Functionalization of Carbon Nanotubes", Angew. Chem. Int. Ed. (2001) 40, pp. 4002-4005	
	13	O'Connell et al., "Band Gap Fluorescence from Individual Single-Walled Carbon Nanotubes", Science (2002) 297, pp. 593-596	
	14	Bronikowski et al., "Gas-Phase Production of Carbon Single-Walled Nanotubes from Carbon Monoxide...", J. of Vac Science & Tech (2001) 19, pp. 1800-1805	
	15	R. Saito, et al, "Physical Properties of Carbon Nanotubes", Imperial College Press, London, (1998)	
	16	Avouris, "Molecular Electronics with Carbon Nanotubes", Acc. Chem. Res. (2002) 35, pp. 1026-1034	
	17	Strano et al., "Electronic Structure Control of Single-Walled Carbon Nanotube Functionalization", Science, (2003) 301, pp. 1519-1522	
	18	Bachilo et al., "Structure-Assigned Optical Spectra of Single-Walled Carbon Nanotubes", Science (2002) 298, pp. 2361-2366	
	19	Weisman et al., "Dependence of Optical Transition Energies on Structure for Single-Walled Carbon Nanotubes...", Nano. Lett. (2003) 3, pp. 1235-1238	
	20	Davis et al., "Phase Behavior and Rheology of SWNTs in Superacids", Macromolecules (2004) 37, pp. 154-160	

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	21	Olah, "100 Years of Carboncations and Their Significance in Chemistry", J. Org. Chem. (2001) 66, pp. 5943-5957	
	22	Bahr et al., "Functionalization of Carbon Nanotubes by Electrochemical Reduction of Aryl ...", J. Am. Chem. Soc., (2001) 123, pp. 6536-6542	
	23	Dyke et al., "Solvent-Free Functionalization of Carbon Nanotubes", J. Am. Chem. Soc., (2003) 125, pp. 1156-1157	
	24	Georgakilas et al., "Organic Functionalization of Carbon Nanotubes", J. Am. Chem. Soc. (2002) 124, pp. 760-761	
	25	Meier et al., "Addition of Nitrile Oxides to C60 Formation of Isoxazoline Derivatives of Fullerenes", Org. Chem. (1993) 58, pp. 4524-4525	
	26	Meier et al., "Benzyne Adds Across a Closed 5-6 Ring Fusion in C70: Evidence for Bond ...", J. Am. Chem. Soc. (1998) 120, pp. 2337-2342	
	27	Himeshima et al., "Fluoride-Induced 1, 2-Elimination of O-Trimethylsilyl-Phenyl Triflate to Benzyne...", Chem. Letters (1983) pp. 1211-1214	
	28	Chiang et al., "Purification and Characterization of Single-Wall Carbon Nanotubes (SWNTs) Obtained ...", J. Phys. Chem B (2001) 105, pp. 8297-8301	
	29	Dyke et al., "Unbundled and Highly Functionalized Carbon Nanotubes from Aqueous Reactions", Nano Letters (2003) 3, pp. 1215-1218	
	30	Dyke et al., "Overcoming the Insolubility of Carbon Nanotubes Through High Degrees of Sidewall Functionalization", Chem. Eur. J. (2004) 10, pp. 812-817	

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	32	Khabashesku et al., " Chemistry of Carbon Nanotubes", Encyclopedia of Nanoscience and Nanotechnology", Nalwa, Am Scientific Pub (2004) pp. 849-861	
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